May 1, 2017 Reference No. 038443

Ms. Leslie Patterson
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Region V
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Dear Ms. Patterson:

Re: Response to United States Environmental Protection Agency (USEPA) Comments Remedial Investigation/Feasibility Study (RI/FS) Work Plan for Operable Units 1 and 2 South Dayton Dump and Landfill Site (Site), Moraine, Ohio

This letter presents responses to USEPA and Ohio EPA's February 24, 2017 and March 1, 2017 comments on the draft Remedial Investigation/Feasibility Study (RI/FS) Work Plan for Operable Units 1 and 2 dated July 26, 2016. GHD has prepared this letter on behalf of the Respondents to the Administrative Settlement Agreement and Order on Consent (ASAOC) for Remedial Investigation/Feasibility Study for OU1 and OU2, Docket No. V-W-16-C-011 (Respondents).

For ease of reference, USEPA's comments are presented below in italics, followed by GHD's response.

USEPA Comment 1

Ensure that changes in the text required in the comments below are reflected in the corresponding appendices and DQO tables.

Response

Comment noted. The work plan text, tables and appendices have been modified based on the comments and responses as explained below.

USEPA Comment 2

Support the discussion of data gaps, conceptual site model, and proposed groundwater investigation strategy by including boring logs and test trench logs.

Response

Boring logs and test trench logs have been added to the work plan (Appendix G).

USEPA Comment 3

Based on Tables B1-B28 in Appendix B, detection limits exceeded applicable criteria in data from VAS, soil sampling, ground water sampling from monitoring wells, and indoor air sampling.

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Discuss this data to support whether or not resampling should occur, especially considering that some of the detection limits were above maximum contamination levels (MCLs).

Response

The tables in Appendix B provide the analytical results for parameters detected in one or more samples for each type of environmental media with notation for each detected value that exceeds the respective criteria. As a clarification, GHD notes that the non-detect values are shown with the corresponding laboratory reporting limit, which may differ from the method detection limit. For example, the laboratory reports include detected concentrations between the method detection limit (MDL) and the reporting limit as estimated concentrations. These estimated concentrations are indicated in the tables with a 'J' qualifier, which is defined in the notes at the bottom of applicable tables. GHD also notes that in some cases the MDL and reporting limit for individual samples may be affected by factors such as matrix interference and sample dilution required to quantify elevated concentrations of individual analytes.

For a variety of reasons, there may be cases where the reporting limits and/or MDLs for individual samples are greater than one or more of the comparative criteria. This will be considered in the ongoing assessment during the RI to identify uncertainties associated with individual sample results. It is likely that these uncertainties will be more pronounced for sample locations that are identified as being relatively un-impacted and/or are outside of the OU1 waste limits. Conversely, sample locations within the waste limits may be more likely to exhibit chemical concentrations for one or more parameters above criteria, resulting in a conclusion that impacts exist without the need to further assess the non-detect values. Re-sampling may be required in cases where significant uncertainties exist, potentially requiring additional sampling and analysis using alternate analytical methods. The uncertainty analysis will be included as part of routine reporting via technical memoranda.

The comment refers specifically to the example of detection limits above MCLs (for groundwater samples). GHD conducted a review of the project database for groundwater samples and notes that four parameters have routine reporting limits that are greater than respective MCLs, as listed below:

Chemical parameter	MCL (µg/L)	Routine Reporting Limit (µg/L)
1,2-Dibromo-3-chloropropane (DBCP)	0.2	2
1,2-Dibromoethane (Ethylene dibromide)	0.05	1
Pentachlorophenol	1	5
Beryllium	4	5

GHD is reviewing reporting and method detection limits with the project laboratory in order to make appropriate adjustments, where feasible.

USEPA Comment 4

Section 1.2.1 Ownership, Pg. 5, 2, last sentence: EPA notes that while it is correct that "Parcel 3274 is not part of the Site as defined in the ASAOC and SOW," it is necessary to determine whether waste and contamination may have migrated to this part of the Quarry Pond through surface water, sediment, waste placement, and ground water migration.

Response

Comment noted. The proposed Phase 1 investigation includes various media within Parcel 3274.

USEPA Comment 5

Section 1.2.1.1 Site Businesses, Pg. 6: Clarify if the last sentence beginning with "There were residences in a trailer park (Parcel 2943) to the southeast across Dryden Road…" means that all of these residences are no longer present.

Response

The work plan text has been modified to present tense to reflect that trailer park residences still exist.

USEPA Comment 6

Section 1.2.2 Site History:

a. Pg. 7, 3. The eastern portions of the Dryden Road Business Parcels are described as not having accepted waste materials, but Figure 2.2 indicates that the depth of native soil on these properties is 10 to 25 feet, so it would appear the properties have non-native material present. Describe the non-native material on those properties and the sampling conducted to support that characterization.

b. Pg. 9, 1, 4th Sentence: Delete the word "small", because Parcel 5177 is the majority of the Central Area.

Response

Part a: The work plan text has been modified as requested to include details of the sampling conducted and descriptions of the non-native material encountered on those properties. Additionally, the work plan text notes that the non-native material present along the eastern portions of the Dryden Road Business Parcels has existed since 1949 at the latest. Based on borehole investigations completed on the eastern and western sides of Dryden Road, non-native material appears to extend beneath the road. This suggests that fill material was used to build up the roadway along and adjacent to Dryden Road, independent of and preceding the Site filling operations.

Part b: The sentence has been modified as requested.

USEPA Comment 7

Section 2.2.1 Waste and Fill Material Investigation, Waste and Fill Material Limits and Types:

a. Add a discussion of the near-OU1-boundary test trenches TT-4, -5, and -19. Address whether the edge of waste was encountered, and whether there is any reason to believe that the waste extends beyond the boundary of OU1 on to the floodplain.

b. This section states that the lateral and vertical limits of waste have been determined, but Section 5.2 and DQO Table 5.1 include the objective to determine of the lateral and vertical extent of the contaminated soil, fill and waste material and to refine the OU1 boundary. Either Section 2.2.1 needs to identify where there is uncertainty that has yet to be determined, or Section 5.2 and Table 5.1 need to be revised to delete this objective.

c. Summarize the areas where waste is expected to be in direct contact with the upper ground water zone.

Response

Part a: The text has been modified to explain observations from the noted test trenches. Additionally, GHD notes that test trenches TT-4, TT-5, and TT-19 were excavated within the man-made embankment, and there is no reason to believe that waste extends beyond this OU1 boundary onto the floodplain. This will be confirmed during the floodplain investigation.

Part b: The text of Section 2.2.1 has been modified to explain that additional data will be collected to refine the waste limits.

Part c: The Section 2.2.1 text has been modified to indicate areas where non-native material is expected to intersect the water table. GHD notes that, at each location where non-native material was deemed to be present at depths equal to or deeper than the groundwater table, GHD completed groundwater sampling from permanent monitoring wells, boreholes, or vertical aquifer sample investigative locations (i.e., VAS-19, MW-209, MW-209A, MW-212, MW-204, VAS-09, MW-215A, MW-215B, VAS-14, MW-216). Therefore, GHD has groundwater data from the saturated zone where non-native material is present.

USEPA Comment 8

Section 2.2.4 Leachate Investigation, Pg. 26, 3rd Bullet: Clarify the discussion, as it would seem that high permeability would allow more discharge to the surface water as water levels recede.

Response

The work plan text has been modified to indicate general observations regarding flooding conditions and possible presence of water within the ponds (Large Pond and Small Pond). Additional assessment regarding hydraulic conditions will be conducted during the RI.

USEPA Comment 9

Section 2.2.5 Landfill Gas and Soil Vapor Monitoring, Pg. 29, Top partial bullet, Last sentence: Change this sentence to "Therefore, based on intrusive investigations, significant decomposing organic material that would readily produce methane is not expected. However, a source exists for the high levels of methane detected in these gas probes, which has not been determined."

Response

The work plan text has been modified as requested.

USEPA Comment 10

Section 2.2.5.1 Vapor Intrusion Study and Mitigation:

a. ***Identify the buildings where completed exposure pathways were not found in previous sampling. Because the workplan does not propose any additional subslab/indoor air samples for these buildings, discuss previous sampling and explain why it is sufficient to preclude the need for additional subslab/indoor air sampling for these buildings.***

b. ***Figure 3.2 appears to show a building in EU 6 that was not part of the vapor intrusion studies. Describe any VI investigation performed on this building (if any), or describe why no VI investigation was performed (if none), and identify additional investigation (if needed).***

c. ***Pg. 30, footnote 14: Add a reference to the document in which the conclusion that the indoor air TCE concentration of 50 ppbv was anomalous and not due to vapor intrusion is made.***

d. ***Pg. 31, 1: Add a few sentences summarizing the O&M activities being performed and refer to the document(s) that more fully describe(s) those activities. Add a statement about why only seven buildings were mitigated when 13 buildings exceeded screening levels in the sub-slab.***

e. ***Pg. 32, 1: Change the sentence to "…evaluation of the sub-slab and indoor air results."***

Response

Part a: The work plan text has been modified in Section 2.2.5.1 as requested. GHD notes that sampling was completed over four separate events in 2012 and the decisions regarding exposure pathways and any required mitigation were made jointly between USEPA and the Respondents. Additional details have been added to the work plan to summarize the decision basis for the various buildings.

Part b: The structure described in USEPA Comment 10b and depicted on Figure 3.2 is a parking area. GHD revised Figure 3.2 to use different line thicknesses for buildings compared to parking areas.

Part c: The work plan has been modified as requested.

Part d: The work plan has been modified as requested.

Part e: The work plan text has been modified as follows:

"The IA screening levels issued by ODH in 2012 continue to apply for evaluation of the indoor air analytical results. The methane screening levels issued by ODH in 2012 continue to apply for evaluation of the sub-slab and indoor air analytical results."

USEPA Comment 11

Section 2.2.6 Surface Water and Sediment Characterization:

a. State the source of the Ecological Screening Values.

b. It is not appropriate to use data collected in the 1990s to evaluate exposure.

Response

Part a: The sources of the Ecological Screening Values are specified in revisions to Appendix B, Tables B.21 and B.22. Note that GHD has been informed that USEPA Region V is now recommending the use of ecological screening values developed by USEPA Region 4 available at the following URL:

http://www.epa.gov/risk/region-4-ecological-risk-assessment-supplemental-guidance

The tables in Appendix B currently reference other sources, which will be corrected in future data presentation.

Part b: Comment noted. Data collected in the 1990s is provided for information purposes only.

USEPA Comment 12

Section 2.2.10 Groundwater:

a. Discuss concentrations of metals in ground water and whether metals are considered COCs in groundwater.

b. Describe and provide supporting information on the extent and/or locations of hydraulic communication and/or confinement between the upper and lower ground water zones. If the available data are not sufficient for this assessment, propose an investigation to collect these data.

Response

Part a: The text has been modified to include discussion of metals concentrations in groundwater relative to RSLs. Based on a comparison to RSLs, specific metals may be considered to be potential groundwater COCs, but this determination will be made during the RI and as part of the risk assessment.

Part b: Additional discussion regarding geology and hydrogeology has been added to Section 2.2.10. The proposed investigation includes additional soil boring and groundwater data collection that will be used to augment existing data and the understanding of geologic and hydrogeologic conditions.

USEPA Comment 13

Section 2.2.10.2 Water Supply Wells, Pg. 43: In addition to the water supply wells on the Valley Asphalt property, provide additional information regarding the number and intended use of water wells within the vicinity (0.25 mile, 0.5 mile, 1 mile) of the Site.

Response

The work plan has been modified as requested with additional discussion and the addition of Appendix I, Table I.1 and Figure I.I.

USEPA Comment 14

Section 2.3 Data Gaps, Pg. 43:

a. ***Add the lack of recent soil gas data from soil gas probes as a data gap.***

b. ***3: Add the areas around BH70-13 and around VAS-24 to the two other locations with elevated TCE identified as data gaps.***

c. ***3: Samples of OU2 shallow groundwater are needed to evaluate migration of contamination above acceptable levels offsite, and migration above Vapor Intrusion Screening Levels (VISLs) is also of interest. Therefore, change the 3rd sentence to "Additional investigation of OU1 and OU2 shallow groundwater is recommended…acceptable risk range, MCLs, or VISLs."***

Response

Part a: The work plan text has been modified as requested to include the soil gas data gap.

Part b: The work plan text has been modified as requested to include the areas around BH70-13 and VAS-24 as data gaps with notation added to indicate locations of the four areas with elevated TCE detections.

Part c: The sentence has been modified as requested.

USEPA Comment 15

Section 2.3.1 Northern Parcels Data Gaps: The vinyl chloride and benzene plumes in the area around MW-219 are not adequately delineated to the north and northwest, as shown by the dashed contour lines in Figures 2.20b and c, to evaluate contaminant migration to the Great Miami River. Add this data gap to the list and propose Phase 1 groundwater sampling to address these gaps in Section 5.7.1.

Response

Section 2.3.1 has been modified to include the area of MW-219 as a data gap. Section 5.7.1 has been modified to include additional groundwater characterization.

USEPA Comment 16

Section 2.3.3 Quarry Pond Data Gaps: Add the following three data gaps and propose activities to characterize them: 1) the lack of sediment data from deep parts of the Quarry Pond, which may be a depositional area and is relevant to evaluate ecological risk; 2) the foreign objects in the pond; and 3) characterization of Quarry Pond fish tissue (Figure 3.1a shows ingestion of fish from the Quarry Pond as potentially complete exposure pathway).

Response

Section 2.3.3 has been modified to read as follows:

"Limited characterization of the fill and soil material and quality (surface and sub-surface) surrounding the Quarry Pond within Parcels 3275 and 5178 has been completed and represents a data gap. Identification of foreign objects present within the Quarry Pond is required to assess their potential effects on the pond. Additionally, characterization of surface water and sediment within the Quarry Pond is required to address data gaps. This includes Quarry Pond surface water (both shallow and at depth) and the sediment in Quarry Pond areas that are easily accessible to humans and with evidence of use (e.g., areas where anglers, recreational users, or trespassers are present), sediment in Quarry Pond areas that may be depositional areas and are relevant to evaluate ecological risk. Further characterization of fish tissue may also be required, depending on the results of the surface water and sediment sampling."

USEPA Comment 17

Section 3.1 Conceptual Site Model:

a. ***Pg. 44, 3 ("Sources"): Discuss the basis for characterizing OU2 as not having landfilled waste, and whether an investigation to confirm this is needed.***

b. ***1 "Receptors": Include uptake by biota in ponds.***

c. ***Pg. 45, 4th bullet: It is unclear here whether GMR/floodplain includes both the GMR and the floodplain, or if it means the floodplain of the GMR. However, Figure 3.1a, which is referenced, does not seem to include the GMR. Contaminated soil and/or groundwater may have migrated in the past to the GMR and caused sediments to be contaminated. Include this as a potential exposure route in the CSM here and in Figure 3.1a.***

Response

Part a: By the definition in the SOW, OU1 includes areas of the Site potentially used for waste disposal and OU2 includes areas where Site-related contaminants have come to be located outside of OU1. Hence waste disposal areas are confined to OU1, the limits of which are to be refined. A footnote has been added to Section 3.1.

Part b: The work plan text has been modified to include uptake by biota in ponds.

Part c: The work plan text has been modified to clarify the GMR and the floodplain.

USEPA Comment 18

Section 4.2.2 Preliminary Remedial Technology Types, Pg. 52:

a. "Institutional Options" appears to be a header for the five bullets below it; if so, it should be in unbulleted, bold and italic font similar to the other headers.

b. Add air stripping under the Removal and Extraction Technologies.

c. For all general alternatives except the "no action" alternatives, unless the alternative will eliminate the need for institutional controls (ICs), add ICs to the alternative.

Response

Part a: The work plan text has been corrected to show "Institutional Options" as a heading.

Part b: The work plan text has been modified to include air stripping in the list of Treatment Technologies (which follows the list of Removal and Extraction Technologies).

Part c: The work plan text has been modified to include the requested notation, see footnote 21.

USEPA Comment 19

Section 4.2.3 Preliminary Remedial Alternatives: Consider adding a general alternative for OU1 that would consolidate material under a smaller cap. If added, ensure that the volume and type of material to be consolidated will be characterized sufficient to evaluate this alternative.

Response

The work plan text has been modified to incorporate the requested alternative involving potential waste consolidation under a reduced cover/cap area.

USEPA Comment 20

Section 5 Proposed Field Investigation Activities: No investigation is proposed on the East River Road properties adjacent to EUs 3, 4, 5, 6, and 8, or on parcel 3274 (Figure 5.1c). Because these properties are directly adjacent to the site, and because exposure routes may exist for receptors in these properties (as shown in Figure 3.1a), the workplan must propose an investigation to determine if site contaminants have come to be located on these properties.

Response

The work plan has been modified to include additional investigation on the noted East River Road properties in Section 5.8. This includes collection of surface soil samples, soil gas monitoring and groundwater sampling. The purpose of these investigations is to determine if there is evidence of contaminant migration from OU1 to these adjacent areas. Parcel 3274 is being investigated as part of the

Quarry Pond investigation and the groundwater investigation, described in Sections 5.4 and 5.7 of the work plan. The investigation includes surface water, sediment and groundwater sampling.

USEPA Comment 21

Section 5.2 OU1 Parcels Soil and Fill Investigation:

a. See Comment 7.b.

b. Pg. 56, 2nd Bullet: Change this sentence to, "…direct contact, inhalation, ingestion, and leaching risks, for input…", reflecting the inclusion of leaching in the 2nd paragraph of page 57. Also add leaching after "ingestion" to the sentence in paragraph 3 on page 57. Add another objective about the soil and fill investigation being input to the soil gas investigation.

c. Pg. 57, 2, 3rd Sentence: State the basis for not considering future exposures to 15 feet by construction workers in the undeveloped parcels in the HHRA.

d. Pg. 57, 2nd and 3rd Bullets: Soil and fill sample analyses should also include chromium speciation (due to disposal of sludge wastes), asbestos (due to disposal of brake lining dust), fine fraction (<100 µm) lead (due to disposal of foundry sand, slag, and brake lining dust), and dioxins/furans (due to disposal of burned materials and incinerator ash, and on-site combustion of waste materials), as presented in Sections 1.2.2 and 2.2.3.

e. Pg. 58, 3rd Bullet: Surface soil samples should be collected from EU10.

f. Pg. 58: Explain why no surface soil samples are proposed for EU16.

g. Pg. 59, 3rd Bullet, 1st Sentence: Because only seven surface soil samples will be collected from EU3, maximum detected concentrations will need to be used as exposure point concentrations (EPCs) in surface soil in the HHRA.

h. Pg. 59, 2, 2nd Sentence: A minimum of 10 background samples should be collected from each soil interval of interest (0-2 ft and 2-15 ft), yielding a minimum of 20 background soil samples.

Response

Part a: Comment noted. The soil/ fill investigation will provide additional data to refine the waste limits.

Part b: The work plan text has been modified as requested.

Part c: The work plan text has been modified to explain that construction worker exposure is not expected due to the low potential for future development within the areas of the Site that are currently undeveloped. This is related to anticipated cap/ cover placement within these areas and institutional controls needed to restrict potential exposure to waste materials.

Part d: The work plan has been modified to include additional laboratory analyses for OU1 soil/fill samples as outlined by the following:

Samples for chromium speciation will be collected and analyzed based on the results of total chromium analysis, i.e., analysed for chromium speciation if the total chromium concentration in the sample exceeds 0.3 mg/kg (the residential soil RSL for hexavalent chromium). The project laboratory will be instructed to report estimated concentrations of total chromium between the RL (0.5 mg/kg) and the MDL (0.2 mg/kg).

Samples for asbestos analysis will be collected and analyzed.

Samples for fine fraction (<100 µm) lead will be collected and analyzed based on the results of total lead analysis, i.e., analysed for fine fraction lead if the total lead concentration in the sample exceeds the residential soil RSL (400 mg/kg).

Samples for dioxin/ furan analysis will be collected and analysed for locations within areas most likely to exhibit the presence of burned materials and ash. Specifically this includes EU16, EU18, EU19, and the western portions of EU12 through EU15. The analytical results for these samples will be used to assess the need for additional characterization, based on the data distribution and comparison to RSLs for direct contact.

Part e: The work plan has been modified to include surface soil samples from EU10.

Part f: The work plan text has been modified to explain that no surface soil samples are proposed for EU16 due to the presence of large quantities of reclaimed asphalt, aggregate and other materials.

Part g: The work plan has been modified to increase the number of soil samples for EU3.

Part h: The work plan has been modified to clarify the soil background samples locations and quantities. This includes a total of 20 background surface soil (0 to 2 feet bgs) samples collected from park areas and roadside areas, i.e., 10 samples from each type of area.

The background surface soil samples are intended to be comparable to surface soil samples collected at the Site, which exhibit similar characteristics and do not contain waste/fill material. For example, surface soil samples will be collected from the East River Road properties, adjacent to OU1. These data will be assessed relative to the background soil data, to identify differences.

Background soil samples from deeper intervals (2 to 15 feet bgs) are not proposed at this time since it is anticipated that OU1 samples collected from 2 to 15 feet bgs will likely contain a mixture of soil and waste/fill. This would pose problems for comparability with background locations that are expected to contain native material.

USEPA Comment 22

Section 5.3 Soil Vapor Monitoring, Pg. 60, 1:

a. Sampling activities (soil gas, groundwater) to delineate the soil gas impacts should begin with Phase I. Use historic soil gas data, the presence of VOCs in soil, and groundwater above VISLs to determine soil gas sampling needs. At a minimum, Phase I should address areas of on-site volatile organic or methane exceedances where the extent and source are unknown, such as near GP09-09. In addition, an updated round of soil gas samples should be collected from existing probes in Phase I, all new soil borings should be sampled for soil gas , and locations for additional probes should be identified. Correct Table 5.2 consistent with this comment.

b. Bulk soil data is not a reliable indicator of the potential for soil gas impacts. The presence of VOCs in soil, the presence of groundwater concentrations above EPA VISLs, and the historic soil gas concentrations detected in existing soil gas probes should be used to indicate the need for soil gas sampling in areas where soil gas samples have not yet been collected.

c. It states that existing soil gas probes will be sampled for field parameters concurrent with Phase 1; however, there is no mention of this sampling in the Soil Gas Investigation DQO Table 5.2. Reconcile this discrepancy but add the soil gas sampling mentioned in the comment above.

Response

Part a: The work plan has been modified to include additional soil gas probe installation and monitoring during the initial phase of work, as described in Section 5.3. For Phase 1 GHD proposes additional soil gas probes to expand coverage within the central part of OU1 where municipal solid waste disposal has been reported. In addition, new soil gas probes are proposed to investigate East River Road properties. Phase 1 also includes assessment and monitoring of all existing soil gas probes and replacement of probes that were screened at an interval less than 5 feet below ground surface. Regarding the area of GP09-09, GHD proposes to investigate soil conditions within Parcel 4610 as part of the OU1 soil/fill investigation, to develop an understanding of potential sources of VOCs. This area is also subject to further groundwater investigation and soil gas sampling on the adjacent properties.

Part b: The work plan has been modified to include additional soil gas probe installation and monitoring during Phase 1 as noted above. Phase 1 also includes additional investigation of OU1 soil/fill and groundwater to further develop the understanding of potential soil gas impacts. Collectively, the Phase 1 information will be used to assess areas of VOCs above screening levels in various media and to develop recommendations for additional soil gas investigation in subsequent phases.

Part c: The work plan text and Table 5.2 have been modified in accordance with the above.

USEPA Comment 23

Section 5.4 Quarry Pond Investigation:

a. Pg. 60-61.

i. Add an objective to determine whether the foreign objects in the Quarry Pond may be sources of contaminants to the Quarry Pond.

ii. The top partial paragraph of page 61 suggests that, if direct observation of the objects is not possible, surface water, sediment, and groundwater data will be used as indirect evidence to assess the nature of the foreign objects in the Quarry Pond. Discuss how these data would be used in this assessment, especially considering that sediment sampling locations will likely be selected to avoid these objects.

b. Pg. 61, 1st Bullet:

i. Only five surface water samples are proposed for the Quarry Pond; this is too few samples to evaluate a 10-acre surface water body. At least eight samples in total for the Quarry Pond are needed to calculate a 95% UCL on the mean concentration. Also, collect additional surface water samples in deeper locations where fish are present, not solely along the perimeter of the pond.

ii. The investigation goes not appear to evaluate the groundwater-to-surface water interface pathway. Sampling surface water alone is not sufficient because the work plan acknowledges a likelihood that some component of the Upper and possibly the Lower Aquifer Zone recharges the Quarry Pond. Primary recharge flows generally from the north/northeast (varies during year) towards the Quarry Pond; and VAS-12 located adjacent to the north side of the Quarry Pond had TCE detections ranging in concentrations from 2 to 6 µg/L. Additionally, the area northeast of Quarry Pond (MW-209, MW-209A, and VAS-19) detected vinyl chloride, predominantly in the Lower Aquifer Zone, with concentrations in VAS-19 ranging from 40 to 150 µg/L between the depths of 37 and 57 ft bgs. These results indicate the potential for contaminants to migrate to the Quarry Pond and therefore the pore water zone. Include sampling activities along the perimeter and down gradient of the Quarry Pond (i.e., along the northwest side near the GMR, along the southern edge between MW-218A/B and MW-214, etc.) in the first fieldwork mobilization to delineate groundwater to the degree necessary to evaluate potential contaminant migration to or from the Quarry Pond.

c. Pg. 61, 2nd bullet: Add methylmercury to the analyte list.

d. Pg. 61, 3rd bullet: Justify why nine sediment samples all located along the shoreline will be representative of and sufficiently characterize the entirety of the sediment in the Quarry Pond. State that 20 surface sediment samples will be collected, positioned both near shore and distributed throughout the Quarry Pond, to provide sufficient data to determine nature

and extent of contamination for an area of this size as well as for risk assessment purposes. In addition, a subset (10 locations) of the 20 surface sediment locations should be selected for co-located core samples. The core samples will help support the evaluation of the nature and extent of contamination at depth.

e. Pg. 61, 4th bullet:

i. The text states that to identify ecological risks, areas of deposition will be targeted for representative sediment sample locations. Clarify if the identification of depositional areas will be limited only to the areas along the shoreline as with the other proposed sampling, or will include the entire Quarry Pond.

ii. Human health risk areas will be targeted as areas where sediment can support body weight. Explain the measurable criteria for sediment supporting human bodyweight and for soft sediment for ecological evaluation; and if they differ, explain how the nine sampling locations will be split up between the two classifications.

iii. The text states that to identify risks to human health, areas easily accessible to humans, such as anglers, would be targeted. Since anglers may also consume the fish caught and that some of the fish consume benthic invertebrates, explain how sampling sediment only along the shore, line is protective of human health.

f. Pg. 61, 6th bullet: Add silver and methylmercury to the list of analytes.

Response

Part a: The work plan text has been modified to include the objective regarding the foreign objects in the Quarry Pond. It is anticipated that the nature of the foreign objects will be determined using sonar imaging techniques. Direct observation methods are not proposed due to poor visibility and safety concerns. If feasible, surface water and/or sediment samples will be collected in the vicinity of foreign objects that are suspected sources of contamination. Based on the technical limitations associated with identifying foreign objects and characterizing potential impacts, it will be necessary to rely on the aggregated surface water and sediment data within the Quarry Pond, and surrounding groundwater data, to assess the Quarry Pond conditions more generally.

Part b: The work plan has been modified to include additional surface water sampling locations (8 to 10 total) within the Quarry Pond. This includes locations near the perimeter of the pond in shallow water and locations within deeper areas (where shallow and deep samples will be collected). The sample locations will consider the presence of foreign objects. In addition, VAS and new monitoring wells are proposed to assess groundwater conditions around the perimeter of the Quarry Pond.

Part c: The work plan has been modified to indicate that surface water samples for methylmercury analysis will be collected and analyzed pending the results of mercury analysis, i.e., if the mercury concentration in the sample exceeds the ecological screening level (ESL) for methyl mercury

(0.0028 µg/L). Any sample that contains mercury at a concentration of 0.0028 µg/L or greater will also be analysed for methyl mercury.

Part d: The work plan has been modified to include additional sediment sampling locations within the Quarry Pond (up to 20 total). This includes locations near the perimeter of the pond in shallow water and locations within deeper areas (where core samples will also be collected, if feasible). The sample locations will consider the presence of foreign objects.

Part e: The work plan has been modified to indicate that surface water and sediment samples will be collected at various locations within the Quarry Pond. The sample locations will include both near shore areas where anglers may be present and deeper areas as noted above. Each sample location will be categorized according to depth and type of sediment encountered. A probe will be used to investigate the sediment conditions specifically whether soft material is present or harder material that is resistant to penetration, if feasible. This information will be used in the risk assessment to identify types of potential exposure and areas of deposition.

Part f: The work plan has been modified to indicate that sediment samples for silver and methyl mercury will be collected and analysed.

USEPA Comment 24

Section 5.5 Floodplain Investigation, Pg. 62: The floodplain sampling should include discussion that sampling locations will be revised if necessary to assess drainage areas such as small ditches and topographically low areas, etc. where runoff from the levee could have preferentially deposited material.

Response

The work plan text has been modified to clarify that sample locations will be selected based on drainage considerations such that samples will be collected from ditches and low areas. The existing topographic information indicates the presence of a drainage pathway that runs parallel to the embankment, sloping downward toward the southwest. The floodplain soil sample data will be used for input to the risk assessment for potential exposure within the floodplain. It will also be used to assess potential transport of impacted sediment from OU1 toward the GMR.

USEPA Comment 25

Section 5.6 GMR Investigation: Due to the potential for historical contamination to have impacted the GMR and the potential for current groundwater contamination to migrate to the river, an investigation should be conducted to determine whether site-related impacts are present within Great Miami River that is not dependent on the presence/absence of soil/floodplain soil impacts. Propose sediment sampling in Phase I to investigate whether site contaminants have migrated to the GMR, and if so, to characterize them.

Response

GMR sediment sampling in Phase 1 of the investigation is not proposed. Fundamentally, we believe that it is necessary to determine whether Site-related contaminants are potentially migrating from OU1 toward the GMR to be able to conduct a meaningful assessment. The work plan includes at least two elements that will be used for this purpose, specifically soil sampling within the floodplain and groundwater sampling along the perimeter of the OU1 boundary. The floodplain area represents the buffer between OU1 and the GMR where Site-related impacts are most likely to be observed if present. The soil sampling in the floodplain will be focused within drainage channels and topographically low areas to assess the possibility of overland transport and accumulation of contaminants from OU1 in an effort to reduce influences of upstream constituents that could have been historically deposited within the floodplain present at the SDD site. Background floodplain soil samples are also proposed to assist with assessing upstream conditions. The groundwater investigation will be used to identify plume conditions and potential zones for discharge to the river. In this manner, it will be possible to assess potential contaminant migration pathways from the Site that are most likely to result in a discernible effect within the GMR. Following completion of the proposed floodplain soil and groundwater sampling activities we will be in a position to assess the appropriate means of GMR investigation, if required. The work plan text has been modified to clarify this approach.

While the PRP group understands the USEPA's desire to characterize the sediments in the GMR adjacent to the SDD Site, the PRP group would like to emphasize that determining impacts, if any, relating to the SDD Site and GMR sediments may ultimately not be possible. Given the dynamic nature of the GMR and the historic industrial activities within the watershed upstream of the SDD location, a correlation with any constituents found in sediments adjacent or downstream of the SDD Site and the SDD Site itself may not be possible.

USEPA Comment 26

Section 5.7 Groundwater Investigations:

a. Include water level measurement events as a part of the investigation.

b. Analyze for total and dissolved metals in all samples.

Response

Part a: The work plan has been modified to include proposed quarterly water level measurements for one year at all monitoring wells and at surface water reference points within the Quarry Pond and GMR.

Part b: The work plan has been modified to specify parameters to be analysed at each proposed VAS and well installation, see the revised Table 5.9. Note that the work plan includes labelling for the individual proposed locations on the figures and the revised Table 5.9. Generally, groundwater samples will be collected and analyzed for VOCs, and additional parameters are included depending on the purpose of the individual sampling location. At locations that include metals analysis, both filtered and unfiltered samples will be collected and analyzed.

USEPA Comment 27

Section 5.7.1 OU1 Groundwater Investigations:

a. ***In order to characterize the current state of ground water contamination, propose to sample any existing monitoring wells on and off-property that have not been sampled since January 1, 2014.***

b. ***Include water level measurement at all sampling points.***

c. ***This section describes the Phase 1A/1B/2 investigation which began in 2013 in different terms than what is found for the Phase 1A/1B/2 investigation in Table 5.6. If these are two different things, use a different label to avoid confusion. Otherwise, make Section 5.7.1 and Table 5.6 consistent, and make clear which DQOs have been satisfied from previous investigations, which are currently being investigated, and which will be addressed in the future.***

d. ***Area 1:***

- ***i.*** ***One VAS boring is proposed in the location of highest historical TCE detections (Figure 5.4). This will not delineate the boundary of the unbounded TCE plume in this area shown in Figure 2.20a. The plume should be delineated prior to locating monitoring wells, so VAS borings that step out from the area of highest concentration are needed, with additional locations that step further out contingent on the results.***
- ***ii.*** ***There is insufficient data to the northwest of the vinyl chloride plume at BH43-13, BH31-13 and BH39-13 to delineate it at and beyond the perimeter of the landfill (Figure 2.20b). Propose additional VAS borings here to delineate the plume with the potential to locate monitoring wells.***
- ***iii.*** ***Although it seems likely that the vinyl chloride plume extending south and southwest of MW-228 (Figure 2.20b) is below 2 µg/L at the landfill perimeter, there is insufficient data to demonstrate this. Add sampling to delineate the plume.***

e. ***Area 2 and/or 3, Pg. 64 : Consistent with comment 15, propose Phase 1 groundwater sampling to address the incompletely delineated vinyl chloride and benzene plumes in the area around MW-219.***

f. ***Area 3, Pg. 64: The well north of BH46-13 is proposed to be set across the water table at a depth of 25-35 feet bgs. Since the benzene occurred in the sample collected at 31-34 feet bgs in BH46-13, the well screen should be centered on the 31-34 foot interval regardless of water table depth, unless the BH46-13 boring log shows elevated PID readings above the 31-35 feet interval.***

g. ***Area 6, Pg. 66, 3: The workplan states that no additional groundwater samples for laboratory analysis will be collected, but the intended purpose of the well as described on page 65 is to***

monitor groundwater quality. Clarify whether the purpose is only to determine the presence of free-phase NAPL, or whether groundwater samples will be collected and analyzed. EPA recommends collecting groundwater samples for analysis from all proposed monitoring wells (temporary and permanent).

h. MW-210 Area:

i. Figure 5.5b was not included (Figure 5.5 shows proposed locations at DP&L). Perhaps Figure 5.4b was intended?

ii. The two proposed monitoring wells shown in Figure 5.4b may be useful to monitor the plume in the immediate area of MW-210, but they are not sufficient to delineate the TCE plume shown in Figure 2.20a. Because this plume is already known to migrate outside of OU1, propose additional delineation activities in the first round of sampling.

Response

Part a: The work plan has been modified to include sampling of existing monitoring wells that have not been sampled since January 1, 2014. The wells will be sampled during a single sampling round in the early stages of the field program.

Part b: The work plan has been modified to include proposed quarterly water level measurements for one year.

Part c: The work plan has been modified so that the Phase 1A groundwater investigation that was completed in 2013 is referred to as Phase 1A-2013.

Part d-i, ii: The work plan has been modified to include three additional temporary monitoring wells north and west of the proposed VAS location (now labelled as VAS-31). These are identified as BH01-17, BH02-17 and BH03-17 on Figure 5.5a. The results from VAS-31 will be used to assess vertical VOC distribution relative to the VOC detections at BH30-13, BH31-13, BH35-13 and MW-229. [Note that available information from VAS-01 and VAS-05, located west and southeast respectively of proposed VAS-31; indicate no VOC detections above MCLs.] The results from BH01-17, BH02-17 and BH03-17 will be used for lateral delineation of VOCs detected at BH30-13, BH31-13, BH35-13, MW-229, as well as BH39-13 and BH43-13. Additional delineation sampling and/or well installation will be determined based on the results from the proposed VAS and temporary monitoring well locations.

Part d-iii: The work plan has been modified to include two additional temporary monitoring wells southwest of MW-228. These are identified as BH05-17 and BH06-17 on Figure 5.5a. Additional delineation sampling and/or well installation will be determined based on the results from the proposed temporary monitoring well locations.

Part e: The work plan has been modified to include two additional temporary monitoring wells north and northwest of MW-219, in addition to the new monitoring well located near BH46B-13. These are identified as BH04-17, BH07-17 and MW-230 on Figure 5.5a. Additional delineation sampling and/or well installation

will be determined based on the results from the proposed temporary and permanent monitoring well locations.

Part f: The borehole log for BH46-13 indicates a PID reading of 397 ppm at around 26 feet bgs and water present at around 32 feet bgs. Hence, it was screened from 31 to 35 feet bgs. At nearby BH46B-13 no elevated PID readings were observed and the water depth was 28 feet bgs. The proposed screen interval of 25 to 35 feet bgs for the new monitoring well (labelled as MW-230 on Figure 5.5a) would intersect the water table and the area of highest PID reading at BH46-13. This may need to be adjusted in the field depending on water level encountered during drilling with the goal of ensuring adequate water column within the well to facilitate subsequent sampling.

Part g: The work plan has been modified to state that groundwater samples from the proposed Area 6 temporary well (identified as BH09-17 on Figure 5.5b) will be collected and analyzed for parameters listed in Table 5.9.

Part h: The MW-210 Area is shown on Figures 5.5b and 5.5c in the updated work plan. The work plan has been modified to include three additional temporary monitoring wells in the area southwest of MW-210 and one VAS location. These are identified as BH11-17, BH12-17, BH13-17, and VAS-36 on Figure 5.5c. These are in addition to the two new monitoring wells, shown as MW-231 and MW-232 on Figure 5.5b. Additional delineation sampling and/or well installation will be determined based on the results from the proposed VAS and monitoring well locations.

USEPA Comment 28

Section 5.7.3 OU2 Groundwater Investigation: Existing groundwater data indicates that incompletely-defined contaminant plumes originating in OU1 are migrating outside of OU1. Revise the work plan to propose OU2 groundwater investigation activities, based on existing data, to be performed concurrently with the OU1 groundwater investigation.

Response

The work plan has been modified to include proposed additional groundwater investigations as discussed in the response to Comment 27 above, including VOC delineation related to Areas 1, 2 and 3 toward the north and west within the OU1 boundary; and VOC delineation southwest of MW-210, beyond the OU1 boundary. In addition, further investigations are proposed to delineate VOCs detected at BH70-13 in Area 5 and groundwater investigation is included in the area around the Quarry Pond outside of OU1.

USEPA Comment 29

Section 6 Background Comparisons:

a. The proposed background floodplain sampling area as shown in Figure 6.1 may be too close to the site since site-related airborne deposition may have affected the area. Evaluate alternative areas to sample background floodplain soil.

b. Pg. 68: The first paragraph and bullet says that the background comparison methodology is noted for the Site Soil, Phase 1B. The Floodplain Soil should be added, since floodplain background samples will be collected.

c. Pg. 69, 1: This paragraph is vague. Clearly describe the specific use of background comparison results including risk assessment application and any other use, and make the DQOs consistent with that description.

d. Pg. 69, 3:

i. Describe how the proposed roadside background soil samples will be used. It might be appropriate to compare background and site locations that are beside roads, but it is not appropriate to compare a background roadside location to a location within the site that is away from a road.

ii. Sentence 4: The northern part of Parcel 3264 may have formerly been used for agricultural purposes, and metals-based pesticides (including lead or arsenic) may have been applied on crops. In addition, it may have received airborne deposition from site activities due to its close proximity, and part of it has been developed in recent years. EPA recommends against using this area for background samples.

Response

Part a: The proposed floodplain sampling area on Figure 6.1 has been re-located to an area further upstream, adjacent to Carillon Park.

Part b: The work plan text has been modified as requested.

Part c: The paragraph has been replaced with the following:

"The purposes and methods for making comparisons to background within the RI/FS include the following:

For investigation areas outside of fill/waste areas (e.g., southern parcels, flood plain soils), determining if constituents are present at levels consistently above/outside of background conditions.

For the Baseline Risk Assessment, establishing exposure levels due to local background conditions, which may include regional anthropogenic contaminants and naturally-occurring parameters at concentrations that exceed default human health and ecological screening levels. Establishing background exposure levels will allow the determination of any incremental risk due to contamination present at the Site."

In DQO Tables 5.1 and 5.5, under 1.iv (General intended use for data), statements have been added that background data will be used to generate Background Threshold Values (BTVs), against which individual process soil and fill (Table 5.1) or floodplain soil (Table 5.5) samples will be compared:

Part d-i: The work plan text has been modified to indicate that the roadside background areas are included for potential comparison to Site sample locations that are also adjacent to roads.

Part d-ii: The text and Figure 6.1 have been modified to remove reference to Parcel 3264 and to include another potential location at Ora Everett Park, located further south.

USEPA Comment 30

Section 6.1 Background Comparison Approaches:

Pg. 69, last: A spatially-adjacent elevated concentration is one piece of evidence that meaningful contamination is present; however, it is not uncommon to have a multitude of exceedances of BTVs based on the 95th percentile that are not spatially-adjacent. Sometimes contamination levels of concern appear more randomly across a site, and absolving all cases of exceedances BTVs based on the 95th percentile which are not spatially-adjacent is inappropriate. Reference the document(s), presumably listed in Section 6.2, that recommend(s) consideration of the spatial patterns of sample results when determining whether concentrations are elevated above background. Section 1.5 of EPA's ProUCL 5.1 Technical Guide recommends re-sampling to confirm the sample result, but not looking at spatial distribution. The ProUCL guide also discusses comparing the frequency of exceeding values (spatially-adjacent or not) to a 5% level (when using a 95th percentile BTV) as appropriate. If no adequate documentation of this approach exists, remove it from the workplan (see also Comment 32.b and make consistent with Section 6.3 of the workplan).

a. Further, in skewed distributions (which is common in such investigations) parametric BTVs based on the 99th percentile can be much larger than those based on the 95th percentile. The use of BTVs based on the 99th percentile is not common in background comparisons and strict adherence to the strategy laid forth in the document with regards to BTVs based on the 99th percentile is not advised.

b. Pg. 70: The last paragraph states that it is important to try to match soil types/textures where background comparisons are to be made; however, there is no discussion about how this will be accomplished.

Response

First paragraph: As noted in the comment, re-sampling to confirm a sample result above background is a typical approach found in guidance, which reduces the likelihood of a false positive result ("Type 1 error"). The approach proposed in the Work Plan draft was to use spatially-adjacent samples as surrogates for additional re-samples in evaluating data where a constituent concentration was found to be in a "grey zone" between the 95th percentile and 99th percentile of background. As noted in various USEPA guidance documents cited in Section 6.2 of the Work Plan (e.g., USEPA 1994, 2002), the possibility of false positive results increases with the number of statistical comparisons made, such as when multiple constituents and sample locations are being evaluated against background conditions. Per the note in the comment,

the ProUCL guide also acknowledges this issue in its discussion of comparing the frequency of exceeding values to the percentile of background used (e.g., 5 percent for a 95th percentile BTV).

An additional consideration in the proposed approach was the specification of a minimum Type 1 error rate of 0.01 for individual comparisons found in RCRA regulations (e.g., see 40CFR264.97(h) for groundwater). In terms of BTV comparisons, this would more closely correspond to the use of a 99th percentile BTV than a 95th percentile BTV.

The comment suggests that USEPA's preference is to utilize a re-sample approach in confirming conditions above background, and this has been incorporated into the Work Plan. However, the Respondents propose to reserve the option to conclude that the area surrounding any given location is impacted above background conditions without collecting re-samples, if clearly evident from the initial investigative results (e.g., if spatially-adjacent samples are above a 95th percentile BTV and/or an individual sample has a concentration above a 99th percentile BTV).

Part a: As noted in the response above, per USEPA's preference a re-sampling approach to evaluating sample locations with constituent concentrations in the grey zone between the 95th and 99th percentiles of background has been incorporated into the Work Plan. The allows for re-sampling to confirm concentrations found within the grey zone, but also permits a conclusion of impact above background without a resample if the constituent concentration is high enough (e.g., above the 99th percentile BTV).

Part b: The text has been modified to indicate that soil classification information will be used to determine the comparability of the background sample set to the other investigative samples of interest.

USEPA Comment 31

Section 6.2 Relevant Guidance and References:

a. Pg. 70-71. Add the following relevant U.S. EPA CERCLA guidance documents: 1) EPA, September 2002. Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Site. Office of Emergency and Remedial Response, United States Environmental Protection Agency Washington, DC. EPA 530-R-01-003; 2) USEPA, April 2002. Role of Background in the CERCLA Cleanup Program. Office of Solid Waste and Emergency Response, United States Environmental Protection Agency Washington, DC. OWSER 9285.6-07P.

b. Pg. 71, 2 (also on Pg. 73, last bullet): The text states that the Mann-Whitney/Wilcoxon Rank-Sum test and the modified Quantile test will be used, but the current version of ProUCL (Version 5.1) no longer offers that strategy, or for that matter, even offers the Quantile Test. Explain the basis and strategy for the dual use of these tests.

Response

Part a: The first requested guidance document was already present in Section 6.2. The second requested guidance document has been added to the list in Section 6.2.

Part b: Numerous statistical hypothesis testing procedures for comparing two samples (in this case, site and background) exist. The selection of an appropriate procedure requires assessing characteristics (e.g., data distributions and the presence of censored/non-detect data) of the data sets being considered. This issue is discussed in a number of the guidance documents listed in Section 6.2 of the Work Plan (e.g., USEPA 1994, 2002, 2006, NAVFAC 2002). These documents include a variety of statistical tests that may appropriately compare to samples, including the Mann-Whitney / Wilcoxon Rank Sum (WRS) and modified Quantile tests.

As noted in the comment, ProUCL's current capabilities are limited for two-sample comparisons and do not include the Quantile test. Many of the other applicable procedures found in the various guidance documents (i.e., USEPA 1994, 2002, 2006 and NAVFAC 2002) are similarly absent in ProUCL. The lack of these tests in the software reflects the stage of its development – it was originally developed for calculating 95UCL values for EPCs in risk assessments, and only later extended to provide other statistical procedures such as group comparisons – and does not limit the applicability of USEPA's existing policy or guidance documents (as noted in the "Notice" on page ii of the ProUCL Technical Guide).

The use of either the Student's *t*-test (where its assumptions are met) or the WRS + Quantile test for comparing site and background conditions in the Work Plan was proposed to be consistent with applicable Guidance (primarily USEPA 2002, 1994 and 2006), and in fact provides a more powerful procedure for identifying conditions above background than would be provided by limiting the assessment to the two tests currently available in ProUCL.

The work plan text (Section 6.2 and Section 6.4) has been modified to provide additional information as noted above.

USEPA Comment 32

Section 6.3 Statistical Consideration:

a. EPA's ProUCL 5.1 Technical Guide indicates that at least 10 samples should be collected (see Section 1.5 and 1.6 of the guide); specify a minimum of 10 samples for each medium and/or stratum.

b. Last bullet: Assuming the approach presented is supported as described in Comment 0, provide more information on the purpose of this approach. Is the goal to identify possible hot spots or to determine if site concentrations are within the range of background? If so, it may be more appropriate to use group-based comparisons. Alternatively, is the goal to reduce the chance of a Type I error? If so, does that increase the probability of a Type II error, and is this acceptable? If the purpose of using the 99th percentile BTV in addition to a 95th percentile BTV is to reduce the probability of error in making remediation decisions, then using single-sample hypotheses tests would be more appropriate with the use of appropriate background threshold values. See Section 6 of EPA's ProUCL 5.1 Technical Guide for information on the use of hypothesis tests.

Response

Part a: The work plan text has been modified to indicate a minimum of ten background samples for each medium and/or stratum. It is noted that the ProUCL Technical Guide (see Sections 1.7.1 and 3.1) also considers a minimum sample size of "8 through 10" based on statistical considerations. Thus, for example, if an outlier point were to be rejected in a background data set, a BTV calculated with the remaining 9 samples would still be considered to have statistical validity.

Part b: Please refer to the response to Comment #30 above. Per USEPA's preference, cases where a site sample has a constituent concentration above the 95th percentile BTV will be subject to re-sampling for confirmation. However, the Respondents reserve the option to decline verification resampling and conclude that site-related impact is present above background conditions at any given location based on the initial investigative sample (e.g., where confirmed by spatially-adjacent samples).

The text of the Work Plan has been modified accordingly.

USEPA Comment 33

Section 6.4 Summary of Statistical Methods Selected for Background Comparisons:

a. ***Pg. 73, 1st and 2nd bullets: Change the reference from EPA's 2013 ProUCL version 5.0.00 software to version 5.1, 2015.***

b. ***Pg. 73, 1st bullet: Consider using the approach the Ohio EPA Division of Environmental Response and Revitalization soil-background group uses for data analyses of sites around Ohio. Before going to a nonparametric analysis, the remaining background data set (minus the outliers) is examined to see if it fits any regular distribution (i.e., normal or lognormal). If the remaining points follow a distribution to a statistically significant level, then that distribution should be applied.***

c. ***Page 73, 2nd bullet under #2: Under conditions when the fraction of non-detects is 10 to 15 percent of the total, and remaining values follow a normal distribution, the non-detect specimens should be assigned values using regression-on-statistics methods, included in the ProUCL software package. The same approach may be used if the detected values follow a lognormal distribution. Even in the case of larger percentages of non-detects, regression-on-statistics methods should be used instead of arbitrary substitutions, so long as the detected values fit a distribution. If the data appear to fit no regular distribution, then the nonparametric methods should be used.***

d. ***Page 73, 3rd bullet under #2: EPA notes that datasets that have up to 50 percent non-detects are a major challenge for any sort of statistical analysis. If this situation occurs, the details of the dataset (e.g., the extent to which the detection limit exceeds the action level, the potential for resampling and using more sensitive analytic methods) should be considered before assigning the appropriate statistical treatment of the dataset. Also see Comment 31.b.***

e. ***Page 74, 1st bullet: Tests of proportions exhibit much reduced statistical power (i.e., are much less sensitive in determining background exceedances) than tests like the Wilcoxon Rank Sum Test. Assuming sample sizes are not very high, such test output may be heavily criticized. The Gehan Test (a modification of the Wilcoxon Rank Sum Test often prescribed for use when non-detect levels carry heavy influence in comparisons) would be more appropriate in this circumstance.***

f. ***Pg. 74: The last sentence of Section 6.4 states "The DQO table (Tables 5.1 to 5.6) specify whether the Respondents will apply individual-based or group-based comparisons for each study question." However, only Tables 5.1, 5.5, and 5.6 are relevant, and do not include any specification regarding individual/group-based comparisons.***

Response

Part a: The work plan references have been updated.

Part b: This approach will be considered, and has been added to the Work Plan. It is noted, however, that the site-specific background samples collected will be relatively small (a minimum of 10 background samples), and that a meaningful assessment of the data distribution requires a bare minimum of 3-4 detected concentrations, under which the non-parametric BTV is a more appropriate alternative.

As an additional clarification, if most or all of the detected concentrations are estimated (J-qualified) values, such that a calculated BTV falls below the detection limit, the detection limit will be taken as the BTV. This is to prevent ambiguous comparisons in which a non-detect site sample could not be meaningfully compared to the corresponding BTV below the detection limit. A note to this effect has been added to the Work Plan.

Part c: The use of regression-on-statistics (ROS) procedures instead of simple substitution for data sets containing up to 15 percent non-detects is acceptable, and has been added to the Work Plan.

Part d: The cases covered by this bullet in the work plan are those with 15 percent to 50 percent non-detects, which means that at least half of the data are detected values. There are challenges posed in statistical comparisons for such data sets, but the methods proposed (WRS + Quantile test) are consistent with USEPA Guidance (1994, 2002, and 2006) and should provide a suitable basis for meaningful comparisons.

As noted by the comment, a sample result with an elevated detection limit due to matrix interference, sample dilution or other factors may occur. In this situation, options will be considered for resampling or the use of alternate methods, especially if the location in question is important for delineating and characterizing conditions beyond the limits of waste material.

Part e: The use of the Gehan Test is acceptable, and has been added to the Work Plan. In order to improve the power of statistical testing, it will be applied in conjunction with the Quantile test (see Section 4.2.4 of NAVFAC, 2002). The results of the Gehan Test, when used, will be carefully considered to see what impact varying detection limits may have on the conclusions (if any). For example, statistical

significance due entirely to varying detection limits should not be a sole basis for remedial decision-making.

As noted in the previous comments, statistical comparisons of heavily-censored dataset comprised mainly of non-detects is a major challenge, and are expected to be subject to limitations in the statistical power of any test applied.

Part f: In DQO Tables 5.1 and 5.5, under 1.iv (General intended use for data), statements have been added that background data will be used to generate Background Threshold Values (BTVs), against which individual process soil and fill (Table 5.1) or floodplain soil (Table 5.5) samples will be compared,

In DQO Table 5.6 (Groundwater Investigation), a specific statistical approach for background comparisons is not listed. At present, an approach to identify a background condition for groundwater has not been developed. Due to the Site's urban setting and the presence of impacted groundwater upgradient of the Site, an appropriate background groundwater data set may be difficult to obtain. Thus, the groundwater evaluation noted in Table 5.6 is focused on comparisons to risk-based criteria (e.g., MCLs or RSLs), and specific comparisons to site-specific background are not presently considered.

USEPA Comment 34

Section 7 Baseline Risk Assessment and Ecological Risk Assessment:

a. Pg. 75, top partial paragraph:

i. This section indicates that an analyte detected in less than five percent of the samples analyzed for each medium will be eliminated as a COPC. Section 5.9.3 of RAGS A indicates that it is not appropriate to eliminate a COPC if it is detected in multiple media. It is not clear if it is appropriate to screen COPCs from soil gas or indoor air based on detection frequency. It is also not appropriate to screen out a COPC that is expected based on historic information or detected at high concentrations that may be indicative of a localized hot spot. Revise this section to address these issues.

ii. Clarify how detection limits elevated above a screening level will be evaluated in the uncertainty analysis.

b. Pg. 75, 1, "Exposure Assessment and Documentation": The exposure assessment will need to add the risks from different exposure units if a receptor is exposed to more than one EU; e.g., a trespasser who is exposed to contaminated sediment, surface water and fish in the Quarry Pond, and floodplain soil in EU2 and EU17. In addition, the estimated cancer risks and non-carcinogenic hazards for each individual exposure pathway need to be summed prior to determining whether the risks are significant. The risk may then be considered significant (i.e., providing the basis for a CERCLA remedial action) when the total site-specific risk from the sum of exposure pathways is above 10-4 for carcinogenic risks or hazard index greater than 1. Clarify the language in the workplan to this effect.

c. ***Pg. 76, 1, Risk Characterization: Despite the explanation and example provided, this section is ambiguous about how the risk assessment will incorporate a comparison to background. State more clearly that the total risk from all COPCs (including those within background) will be presented in the main set of risk estimates. Risk estimates for COPCs within background levels can be presented for comparison purposes. Clarify how the point-based and/or group-based comparison discussed in Section 6.4 will be used in the background risk comparison. Provide further clarification regarding how background data will be used for comparison to site samples and will also be used for risk assessment.***

d. ***Pg. 77, Ecological Risk Assessment: State the timing for delivery of the Ecological Effects Evaluation Proposal. The problem formulation should be presented early in the process as it is the basis for designing the investigation to assess the potentially complete pathways and ecological receptors. It is also important to identify the screening values in advance of sample collection to ensure the analytical method detection limits are below the selected screening levels.***

Response

Part a: The text of *Data Collection and Evaluation, and Hazard Identification* section has been revised to clarify the use of the detection frequency in the screening process, incorporating agency comments regarding various media, hot spots and soil gas considerations. In addition, the text has been revised to provide clarification regarding the uncertainty analysis with respect to elevated detection limits.

Part b: The text of the Exposure Assessment and Documentation section has been revised to reflect how receptors such as trespasser may be exposure to multiply EUs. The text of Risk Characterization section has be revised to reflect it is the sum of the risk associated with each COPC for each exposure pathway for each receptor will be compared to the risk levels noted in the comment.

Part c: The text of the Risk Characterization section has been revised to provide further explanation regarding the evaluation of naturally occurring parameters such as arsenic in the HHRA. In summary, the site-specific risk characterization will include all COPCs, whether related to background conditions or not. Supplemental calculations will be included that considers naturally occurring substances such as arsenic. This will serve to illustrate the contribution of background conditions to the overall site-specific risk for the Site.

Part d: The work plan text states that GHD will submit the Ecological Effects Evaluation Proposal following completion of the problem formulation (Step 1). This will be based on review of existing data and available information on Site conditions, and a Site visit by the GHD ecologist. It is anticipated that Step 1 will be conducted prior to or concurrent with other Site investigation field activities, with consideration of appropriate timing for making field observations.

A comparison of screening values to analytical method detection limits is detailed in the response to USEPA Comment 63 (see Attachment A). In most cases, the detection limits are less than the screening

levels. The cases where the screening level is less than the respective detection limit will be subject to further assessment, to assess the significance of potential uncertainties.

USEPA Comment 35

Figure 2.1: Why is Building 3 missing from the figure (and subsequent figures)?

Response

Building 3 was removed from the figures since it was demolished soon after it was initially identified from the vapor intrusion program. The former location of this building has been added to Figure 2.10, which shows the other buildings that were investigated for vapor intrusion.

USEPA Comment 36

Figure 2.3b: In addition to this cross section, include additional cross-sections in order to better illustrate the geologic and hydrogeologic characteristics of the site.

Response

Additional cross-sections have been added to the work plan. The cross-section locations are shown on Figure 2.3a. Nine cross-sections (A-A' through I-I') are shown on Figures 2.3b through 2.3j. These have been reproduced from previous reports for information purposes, and are subject to revision and update as additional information is collected during the RI.

USEPA Comment 37

Figures 2.8a-2.8c: The specific contaminants above leaching standards are not identified and soil concentrations were not provided. Include the following on these soil leaching exceedance maps:

- ***the soil sampling location,***
- ***the chemicals of concern (COCs) that exceeded screening levels,***
- ***the concentration of COCs that exceeded screening levels, and***
- ***the depth of COC detection.***

Response

The analytical results for OU1 soil samples are included in Table B-3 of Appendix B, with comparison to USEPA SSLs. From inspection of the table, it is evident that there are a large number of detected values that exceed risk-based and/or MCL-based SSLs. These locations are indicated with yellow highlight on Figures 2.8a, b and c. GHD initially intended to provide the COC-specific information on the figures but it became apparent that this type of illustration was impractical due to the amount of information involved. The main purpose of the figures is to illustrate the sample locations, which may be examined in conjunction with Table B-3.

GHD proposes to provide additional figures during the RI to illustrate COC-specific information as requested, incorporating existing and new data. It is probable however that the new figures will be focused on smaller areas or individual exposure units, for practical purposes.

USEPA Comment 38

Figure 2.9: Locations and results for GP-22-13, GP-23-13, GP-24A-13, GP-24B-13, and EPA probes GP-1 to GP-7 are missing from the figure.

Response

Figure 2.9 has been modified to show the probe locations noted by the comment, and associated sample results.

USEPA Comment 39

Figures 2.18a, b, and c: For clarity, remove boring locations, monitoring well locations, and VAS locations that were not completed to the "deep" zone.

Response

Figure 2.18a, b and c have been modified to highlight locations that were completed in the lower aquifer, rather than removing locations completed in the upper aquifer. The reason for this approach is related to the designations used in the project database and CAD system, where some sample locations include data from both upper and lower aquifers. Hence, it is not possible to automatically remove locations as requested.

USEPA Comment 40

Figures 2.20a-2.20d:

a. Modify these figures or add new ones to show VOC plumes for the entire Site (rather than just a portion); VOC isoconcentration contours for the lower aquifer zone (rather than just the upper); and the potentiometric surface (rather than just flow direction).

b. Although these figures indicate general flow direction, include potentiometric maps that show seasonal ground water flow in the upper and lower ground water zones and the interaction between surface water and ground water.

Response

Part a: Figures that show the upper aquifer data for entire Site have been added to the work plan, while also retaining the more detailed views. These are shown on Figures 2.20a through 2.20h. These figures were developed for previous reporting in 2013 and are provided in the work plan for information purposes.

Note that VOC contouring methods are currently under review by GHD. The contouring for both the upper and lower aquifers needs to consider the overall VOC distribution (lateral and vertical) and it is intended to

develop VOC plume illustrations based on three-dimensional analyses using existing and new data. As noted above, the existing Upper Aquifer plume maps (shown on Figures 2.20a through 2.20h) are reproduced from a previous report and included for informational purposes. Maps for the Lower Aquifer will be developed on the basis of three-dimensional analysis but are not available for the work plan at this time.

In summary, GHD proposes to refine the VOC contour maps based on existing and new data collected during the RI based on three-dimensional analyses. At that time, the potentiometric information will also be modified.

Part b: Potentiometric maps have been added to the work plan, see Appendix H. Additional maps will be developed during the RI groundwater investigation.

USEPA Comment 41

Figure 3.1a:

a. Soil is not anywhere mentioned. One of the tertiary sources, which lists media, is "Surface deposition"; clarify if this refers to soil. Storm water runoff is a potential release mechanism to soil as well; include this release mechanism and tertiary source and indicate that it is relevant to all receptors except the Quarry Pond.

b. See Comment 17.b.

c. Footnote 1: EPA agrees that restricting at least part of OU1 from residential use is likely to be a part of the remedy at the site. However, the RI/FS must document the risk to all current and potential future receptors in order to provide the basis for CERCLA cleanup authority, and to support the need for the planned IC on "relevant parts" of OU1. Therefore, the "residents" column must have all relevant pathways marked with an "X" and the risk assessment must evaluate residential exposure.

Response

Part a: The figure has been modified to identify soil as a tertiary source associated with surface deposition and as a secondary source associated with storm runoff.

Part b: The figure has been modified to include uptake by biota in the Quarry Pond, where the tertiary source includes fish.

Part c: The figure has been modified to include residential exposure within OU1 parcels as requested.

USEPA Comment 42

Figure 3.1b: Burrowing and non-burrowing vertebrates are not shown as primary receptors for soil, only invertebrates. Also this CSM only shows primary receptors from the secondary source,

soil. The fill material is exposed at the surface in some areas, and as such has similar primary receptors as soil. The CSM should be revised to show this.

Response

The figure has been modified to include vertebrates and invertebrates as primary receptors for fill material and soil.

USEPA Comment 43

Figure 5.1d: Provide the rationale for why no surface soil samples are to be collected in the central portions of EU6 and EU7.

Response

The central portions of EU6 and EU7 are covered with gravel and/or paved surface material. Figure 5.1d has been modified to show proposed sample locations. At these locations, the soil samples will be collected from the underlying material, below the compacted sub-base material.

USEPA Comment 44

Figure 6.1: The eastern edge of the proposed floodplain soil sampling area is within 100 feet of a railroad. The exact locations within this area must be farther than X feet from the railroad.

Response

The figure has been modified to re-locate the proposed floodplain sampling area to a location further upstream, adjacent to Carillon Park.

USEPA Comment 45

Tables: Add a summary table listing all active monitoring wells on-site and off-property in the vicinity of the Site. Provide well construction details including the ground surface elevation, the well screen interval, the ground water zone being monitored (upper or lower), and the total depth of the well.

Response

A table that provides well construction details has been added (see Appendix G).

USEPA Comment 46

Tables 5.1 and 5.5, Soil/Fill and Floodplain Soil DQOs: Section 5.2 describes evaluating the potential for soil leaching, but these tables do not specify that soil samples will be compared to U.S. EPA SSLs and Ohio EPA leach based soil values (LBSVs). Include in the "Decision Statement" and "Basis of Action Level" steps that soil samples will be compared to U.S. EPA SSLs and Ohio EPA LBSVs. For source characterization, please add these comparisons to the text and DQO tables.

Response

Tables 5.1 and 5.5 have been revised as requested. GHD notes that the action levels and relevant sources are not detailed in the work plan text; the reader is referred to specific DQO tables for further information.

USEPA Comment 47

Table 5.1, Soil and Fill DQOs:

a. See Comment 7.b.

b. Step 1.iv: Include historical data, not just the data collected as described in the DQO.

c. The workplan states that data from sampling locations will be compared to background data to evaluate if the exceedances are site-related. However, for samples collected from non-native material, any exceedances of screening levels are site-related, regardless of comparison with background data. This leaves comparison to background only relevant to soil and sediment. Revise the DQOs to reflect this.

d. Step 1.iv, Phase 1B, seems to say that only samples from the Southern Parcels will be compared to background. It is not clear whether that is because native soil is not expected in other areas of OU1, or why the Southern Parcels are specifically identified.

e. Step 3.i, 4th bullet: Change the middle portion of this sentence to read (bold indicates added language): "…geophysical anomalies, leachate seeps, stains, discoloration, exposed waste, and stressed vegetation have been or are identified, and will adjust…".

Response

Table 5.1 has been revised as requested.

For Comment 47d, reference to Southern Parcel samples in Step 1.iv. Phase 1B has been removed; this was a remnant from the previous iteration of the DQO Table.

USEPA Comment 48

Table 5.2. Soil Gas DQOs:

a. See Comment 22.a.

b. Step 2.i, Phase 2, 3rd bullet: "Affect future use" is somewhat vague; add how soil gas concentrations may potentially impact future buildings.

c. Step 2.iv.a, Phase 2: Modify to indicate that current and future on-site and off-site structures are of interest and potential risks should be based on soil gas data.

d. ***Step 3.iii: Delete Ohio Department of Health (ODH) Industrial and Residential Action Levels from this step unless subslab or indoor air samples are proposed.***

e. ***Step 3.iv: "Appropriate Sampling and Analysis Methods" states that during soil borehole investigation methane values will be recorded in the field using a Landtec GEM-2000. Explain how these measurements will be performed on an open borehole to get representative concentrations to compare to the action level of 10/25% LEL in the soil and provide an SOP for the collection of methane samples that will not be diluted by ambient air.***

f. ***Step 5.i.a (Specify Action Level):***

   i. ***Phase 1 does not include the LEL action levels referred to in Step 3, but they are included in Phase 2. Explain why Phase 1 and Phase 2 are not consistent.***

   ii. ***Delete the use of EPA RSLs for inhalation to screen for soil gas impacts. Section 6.3.1 of EPA's June 2015 OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air guidance document discusses qualitatively evaluating bulk soil concentrations in the vadose zone to determine if they are a potential subsurface vapor source. Revise Table 5.2 to be consistent with this document.***

g. ***Step 5.ii.a: Compare all soil gas samples (including those collected in undeveloped areas) to VISLs.***

Response

Part a: The work plan has been modified to include additional soil gas probe installation and monitoring during the initial phase of work, as described in Section 5.3. See response to Comment 22a.

Part b: The table has been revised to provide more detail regarding potential impacts.

Part c: The table has been revised as requested to indicate that potential risks will be evaluated based on soil gas data.

Part d: The table has been revised in accordance with the comment.

Part e: Table 5.2 has been modified to clarify that soil gas probe monitoring will include methane. During soil borehole investigations methane monitoring will be conducted for health and safety purposes.

Part f-i: Phase 1 Investigation of Site Soil, Fill, and Groundwater did not include LEL action levels because soil gas data was not part of this phase. The DQO table has since been revised to address soil, fill, and groundwater investigations in the same phase as the soil gas probe investigation.

Part f-ii: The table has been revised as requested.

Part g: The table has been revised as requested.

USEPA Comment 49

Table 5.3, Quarry Pond Surface Water DQOs, Substep 4i:

a. Indicate that other health-based levels will be used for chemicals with missing AWQC.

b. The text states that the target population is all water in the Quarry Pond, but surface water sampling is proposed along the shoreline only (see Figure 5.2). Consistent with comment 23.b.i, additional samples, including those away from the shoreline, are needed.

c. Provide the technical basis for the assertion in Section 5.4 that during the summer the Quarry Pond will be in equilibrium, as ponds of sufficient depth typically form temperature zones such as epilimnion and hypolimnion. It is not identified whether the Quarry Pond is deep enough for this to occur, or whether the groundwater flow-through would be sufficient to disrupt the zones. However, if the assertion of equilibrium is the justification for sampling only near the shoreline, then this assertion needs additional justification.

d. Step 3.iv: Perform two sampling events during two different seasons.

e. Step 5.i: Clarify what is meant by "near-Site."

Response

Part a: Table 5.3 has been revised as requested.

Part b: Table 5.3 has been revised as requested, and to ensure consistency with the revised RI/FS Work Plan text.

Part c: The Work Plan text has been modified as a result of this comment to delete the reference to equilibrium conditions. It is noted that samples are proposed to be collected from near surface and at depth (e.g., 5 ft above bottom) in the Quarry Pond.

Part d: The work plan has been modified to include two sampling events as requested.

Part e: Table 5.3 has been revised to remove the text in question, which was a remnant from a previous iteration of the DQO Table.

USEPA Comment 50

Table 5.4, Sediment DQOs:

a. Step 1.iv: Clarify how both Residential and Industrial Soil RSLs will be used to evaluate sediment data from the Quarry Pond when sediment results are above a Residential Soil RSL but below an Industrial Soil RSL.

b. Step 3.ii: Add methylmercury to the list of analytes.

c. Step 6.iv.b: Indicate that the data will also be used in the human health risk assessment.

d. Step 7.i: Collect additional sediment samples in deeper locations which may be depositions areas, and where fish are likely to be present.

Response

Part a: As detailed in the Sediment DQO table, residential soil RSLs will be used in the initial screening step to identify COPCs. In the event where a sediment concentration is greater than the Residential Soil RSL, but less than the Industrial Soil RSL, the sediment result and compound will be further evaluated in the risk assessment.

Part b: Table 5.4 has been revised as requested.

Part c: Table 5.4 has been revised as requested.

Part d: Table 5.4 has been revised as requested.

USEPA Comment 51

Table 5.5, Flood Plain Soil, DQO Step 7.i: Collect background samples at 10 locations (rather than 5) so that at least 10 samples are collected from each soil interval of interest (0-0.5 ft and 0.5-2 ft) for use in comparison with on-site floodplain data.

Response

Table 5.5 has been revised as requested.

USEPA Comment 52

Table 5.6, Groundwater DQOs:

a. Step 6.ii.a, iii and iv.a: It states that no statistical tests are employed, but Step 7.ii talks about 95% confidence UCL. Reconcile this discrepancy.

b. Step 7.i: Replace the term "exposure areas" with a different term to avoid confusion with "exposure units", which would not be appropriate for groundwater.

c. Step 7.i, Phase 2: Do not delete analytical parameters after only one round of sampling.

Response

Part a: As noted in Steps 6ii.a, iii. and iv.a, no statistical test will be employed when comparing analytical results to action levels. The 95% confidence UCL discussed in Step 7.ii is for use in a risk assessment as detailed in Step 7i, or for the purposes of individual-based background comparisons as discussed in Section 6.2 of the RI/FS Work Plan.

Part b: GHD notes that Phase 1A and Phase 1B, Step 7i terminology applies to soil and fill investigations, and as a result, the term "exposure areas" has been changed to "exposure units" to be consistent with the work plan terminology.

Part c: Table 5.6 has been revised as requested.

USEPA Comment 53

Table 5.7: Samples collected below pavement or compacted aggregate should be evaluated for potential future direct contact exposure if those materials are removed. Revise the work plan to indicate direct contact risk will be evaluated in this manner EUs 9 through 15.

Response

The work plan has been modified to indicate that soil samples will be collected from below pavement or compacted aggregate for purposes of assessing potential future direct contact. GHD notes that the possibility of such an event within developed areas such as the Dryden Road businesses is extremely unlikely since the elimination of the pavement would produce conditions detrimental to access and drainage.

USEPA Comment 54

Appendix D, Section 2.3.1, Pg. 10: Revise this section to be consistent with the following comments:

a. ***Soil gas probe depth should be boring specific, and dependent on the potential vapor source. Soil gas probes should be installed as close to the potential vapor source as possible (i.e., near-source) in areas without an impermeable surface, if possible, to ensure that the soil gas data is representative of a reasonable maximum exposure. If a potential vapor source is encountered at depth, deep soil gas samples should be collected near the potential vapor source.***

b. ***Soil gas probes should not be installed at intervals above 5 feet below ground surface to minimize atmospheric influence.***

c. ***It is not clear if setting a maximum depth of 20 ft below ground surface will be appropriate for soil gas probes installed in OU2.***

d. ***When contaminated ground water is the potential vapor source, soil gas samples should be collected directly above the capillary fringe.***

Response

Part a: The work plan has been modified as requested.

Part b: The work plan has been modified as requested.

Part c: The work plan has been modified to state that the target maximum depth of OU2 soil gas probes will be determined based on stratigraphy and depth of groundwater and not necessarily limited to a depth of 20 ft bgs.

Part d: The work plan has been modified as requested.

USEPA Comment 55

Appendix D, Section 2.3.1, Pg. 10, ¶4: Delete the sentence that begins, "Any proposed gas probe locations specified…".

Response

The work plan has been modified as requested.

USEPA Comment 56

Appendix D, Section 2.3.1, Pg. 11, ¶1: State that soil samples from the GPs will be analyzed for VOCs.

Response

In general, soil cores will be logged and screened during borehole advancement using procedures provided in Appendix D – Attachment A9. This procedure will be used during gas probe installation to identify areas of potential VOC presence and to assist with determining gas probe screen interval.

Soil samples for VOC analysis from each gas probe borehole (at the depth of the gas probe screen) will be collected with the following exception. In cases where the gas probe installation is being guided by existing VOC soil sample data, additional VOC analyses are not necessary.

USEPA Comment 57

Appendix D, Section 2.3.2, Pg. 12:

a. 1: Include monitoring for hydrogen sulfide.

b. 2: Revise the FSP to state that additional soil gas samples may be collected to evaluate seasonal and temporal variation, as necessary. In addition, 1-liter summa canisters are typically sufficient for exterior soil gas sampling.

Response

Part a: The work plan has been modified as requested.

Part b: The work plan has been modified as requested. The scope of soil gas sampling will be determined following Phase 1, which includes gas probe installation and field monitoring to assess seasonal variation. The use of 1-liter summa canisters is included as an option in the SOP.

USEPA Comment 58

Appendix D, Section 2.4.1:

a. Pg. 13, 3, 3rd sentence: State that VAS samples will be analyzed for the parameters listed in Appendix D, Section 2.4.4 (TCL VOCs, TCL SVOCs, TCL pesticides and herbicides, TCL PCBs, and target analyte list metals).

b. Pg. 15, #6.ii: Consider using 5-foot well screens to sample at 5-foot intervals to prevent sample bias.

c. Page 15, #7: In order to ensure that ground water samples are representative of aquifer conditions, EPA recommends that pH, specific conductance, and temperature stabilize prior to sampling, regardless of the amount of removed well volumes. This is especially the case when utilizing low-flow purging techniques.

Response

Part a: The work plan has been modified to include additional parameters for VAS samples according to the specific location. This includes TCL VOCs and other parameters as identified in the comment, as specified in Section 5.7 and in a new table (Table 5.9).

Part b: The work plan includes the use of 5-foot well screens to the depth of the first till encountered or 50 feet bgs, whichever occurs first and 10-foot well screens at greater depths. The work plan has been modified to remove the reference to collecting two samples within a 10-foot well screen.

Part c: The work plan has been modified to indicate that in the event that stabilization is not attained before 5 well screen volumes are removed (or a maximum of 2 hours of purging for intervals where water was not added to the formation during drilling and a maximum of 4 hours of purging where water was added to the formation during drilling) then options will be considered including additional purging, cessation of sampling at the current interval, or collecting the sample without attaining stabilization, subject to agency approval.

USEPA Comment 59

Appendix D, Sections 2.4.1.1 and 2.4.1.3: Clarify whether the soil cores collected as part of shallow monitoring well/piezometer installation operations will be field screened (headspace screening) with a photoionization detector.

Response

In general, field screening will be conducted during borehole installation including wells and piezometers. Note that in cases where the field procedure for casing installation involves a nominal offset from an existing borehole, logging and screening of the offset boring is not necessary.

USEPA Comment 60

Appendix D, Section 2.5.2, Pg. 26: Total and dissolved metals should be analyzed for surface water samples. Also, a surface water sampling SOP is not provided in the FSP.

Response

The Work Plan has been modified as requested to include total and dissolved metals analysis.

The surface water sampling SOP is included in Appendix D - Attachment A40.

USEPA Comment 61

Appendix D, Section 2.6, Pg. 27: Surface sediment (0-6 inches) should be collected using an Eckman Dredge sampler or similar device (e.g., Van Veen, Ponar, etc.) rather than a core sampler in order to provide a representative undisturbed sample.

Response

The Work Plan has been modified as requested.

USEPA Comment 62

Appendix D, Attachment A.11:

a. Clarify whether the isopropanol or helium method will be used at this site.

b. For the helium method, while a 10% or greater helium content in the sampling assembly may be adequate for determining when to take corrective actions in the field to ensure a proper seal, using a 5% threshold is more appropriate for determining whether the sample results are reliable and representative.

c. Clarify whether soil gas samples will be analyzed for fixed gases to determine helium content in collected samples.

Response

Part a: Helium will be used as the tracer testing compound during the soil gas investigation. Isopropanol was provided as an option due to occasional Helium shortages and price fluctuations.

Part b: GHD reviewed various technical documents in relation to the proposed 5% threshold including:

- OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (USEPA, June 2015)
- ITRC Vapor Intrusion Pathway: A Practical Guideline (January 2007)
- Ohio EPA Sample Collection and Evaluation of Vapor Intrusion to Indoor Air Guidance Document (Ohio EPA, May 2010)

GHD could not find details in any of the documents concerning the use of a 5% threshold. The Ohio EPA document does detail a 10% threshold, as follows:

> *Because minor leakage of a quantitative leak test chemical compound such as helium (10% or less of the total concentration of the tracer compound in the shroud) around the probe seal should not affect data quality, the presence of low concentrations of helium in the sample is not a major cause for concern. If elevated levels of helium the leak test chemical (greater than 10% in the shroud) are observed in a sample, the soil gas data should not be considered reliable and the probe seal should be modified to reduce the infiltration of ambient air and re-sampled.*

Therefore, no change to the SOP is proposed pending clarification from the agency.

Part c: The SOP has been modified to clarify that fixed gases will not be analyzed by the laboratory. As indicated above, soil gas samples will only be collected if the helium tracer concentration is below 10%.

USEPA Comment 63

Appendix E, Worksheet 15: Numerous action limits are below the quantitation limit. Evaluate whether established methods exist to meet lower quantitation limits; if not, explain how the uncertainty of not being able to detect to the action limit will be addressed. EPA Method 1668A is recommended for PCBs.

Response

See Attachment A for response to USEPA Comment 63.

USEPA Comment 64

Section 2.2.4: The 2nd bullet describes perched groundwater, but it is not clear in the workplan the extent to which the perched groundwater may be a migration pathway for contamination. In the appropriate section (perhaps Section 3), discuss this potential, and clarify that perched groundwater will be sampled if found.

Response

GHD notes that in general 'perched' water implies the accumulation and/or stagnation of infiltrating water within the unsaturated zone due to local soil conditions, suggesting an impediment to migration rather than a pathway.

The text referenced in the comment outlines observations of possible perched water conditions at certain locations in previous investigations. It also points out that these conditions are localized, based on observations from other nearby test pits and boreholes. Hence it is expected that perched water, if present, is limited in extent and downward movement of infiltrating water to the aquifer can occur, unless a discernible confining layer is present.

Soil and groundwater conditions will be further assessed in the OU1 soil/fill investigation and groundwater investigation, as detailed in Section 5 of the work plan. This will include logging each investigative location to identify the possible presence of perched water. Discussion regarding identification and possible sampling of perched water has been added to Section 5.2.

USEPA Comment 65

In addition to the concerns identified in EPA's Comment 29.d.ii about using parcel 3264 for background samples, EPA notes that this parcel is in the 100 year flood plain and downstream of the site. Flooding of the area may have relocated soil contamination from the site onto this parcel, making it even less suitable as a background location.

Response

The work plan has been modified to eliminate Parcel 3264 as a potential background sampling area. As stated in the response to Comment 29d-ii, the text and Figure 6.1 have been modified to remove reference to Parcel 3264 and to include another potential location at Ora Everett Park, located further south.

Should you have any questions on the above, please do not hesitate to contact us.

Sincerely,

GHD

Julian Hayward

VC/cb/16

Encl.

Attachment A

Attachment A Response to USEPA Comment No. 63

USEPA Comment 63

Appendix E, Worksheet 15: Numerous action limits are below the quantitation limit. Evaluate whether established methods exist to meet lower quantitation limits; if not, explain how the uncertainty of not being able to detect to the action limit will be addressed. EPA Method 1668A is recommended for PCBs.

Response

QAPP Worksheet 15 includes individual tables for various media: soil, groundwater, soil gas, surface water and sediment. Worksheet 15 has been updated to include the full list of analytical parameters, as required to correct the version provided in the July 2016 work plan.

Worksheet 15 includes screening levels for individual parameters and the associated quantitation limits (QLs), also referred to as Reporting Limits, and method detection limits (MDLs) from the project laboratory. The QLs and MDLs are based on the use of EPA methods (listed below) that are widely applied and accepted for characterizing environmental media.

Parameter	Method reference
TCL VOCs	SW-846 8260B SW-846 8011 (see note 1)
TCL SVOCs	SW-846 8270C
TCL PCBs	SW-846 8082A
TCL Pesticides	SW-846 8081A
TCL Herbicides	SW-846 8151A
TCL Dioxins/ furans	SW-846 8290
TAL metals	SW-846 6010B/6020
Total cyanide	SW-846 9012
Mercury	SW-846 7471A
Mercury, low-level (surface water)	EPA Method 1631E
Methyl mercury (surface water and sediment)	EPA Method 1630
Chromium speciation (soil/ fill)	SW-846 7196A
Lead – fine fraction (<100 µm) (soil/ fill)	SW-846 6010B
Asbestos (soil/ fill)	EPA/600/R-93/116

Note:

For 1,2-Dibromo-3-chloropropane (DBCP) and 1,2-Dibromoethane (Ethylene dibromide) in water samples.

Note that estimated values (between the QL and MDL) will be reported by the project laboratory. Also the QL and MDL values achieved for individual samples may be adjusted according to moisture content; matrix effects; and dilution required to quantify the range of chemical concentrations detected.

Regarding EPA Method 1668A for PCB analysis, GHD notes that this method provides results for approximately 200 different congeners. USEPA regional screening levels for PCBs are listed for seven individual Arochlors. Therefore, the analytical results using EPA Method 1668A are not directly comparable to the regional screening levels, and the use of this method is not proposed.

Additional discussion based on observations of the individual QAPP worksheets is provided below.

Soil (Worksheet 15-1)

The MDLs for soil parameters are less than the corresponding Residential and Industrial Soil Regional Screening Levels (RSLs) for all parameters. On this basis, the screening process can be completed by direct comparison of the soil data to the screening levels without limitation. Similarly, the MDLs for soil parameters are less than the corresponding ecological screening levels in most cases; exceptions exist for fewer than five chemicals, and in each case the screening level is within the same order of magnitude as the MDL. In cases where a chemical is not detected and the screening level is below the MDL, the potential presence of the chemical will be assessed using lines of evidence based on available data for other media and other information such as Site history. Potential uncertainties will be further assessed for chemicals that are identified as potentially present. As required, supplemental risk calculations will be conducted to conservatively estimate the effects of individual chemicals with respect to the calculated risk levels.

USEPA RSLs for protection of groundwater (SSLs) are categorized as either risk-based or MCL-based. These are established using conservative assumptions related to soil partitioning, leaching and mixing in underlying groundwater. In many cases, the SSL values are significantly less than the MDLs of widely used analytical methods. For purposes of assessing the soil data relative to SSLs, all detected and non-detect values will be evaluated to determine their potential significance. This will include an overall comparison with all available soil and groundwater data to determine the data distribution and correlations. Since the SSLs are intended to provide indication of potential impact to groundwater, the actual Site groundwater data will provide a basis for assessing the significance of the soil analytical results. This is consistent with a weight-of-evidence approach for identifying potential contaminants of concern (COCs), based on characterization of multiple media and other available information.

Groundwater (Worksheet 15-2)

The MDLs for groundwater parameters are less than the corresponding USEPA Regional Screening Level MCLs for all parameters. The MDLs for groundwater parameters are less than the corresponding vapor intrusion screening levels (VISLs) for protection of industrial indoor air. On this basis, the screening process can be completed by direct comparison of the groundwater data to MCLs and industrial VISLs without limitation.

The MDLs for groundwater parameters are less than the corresponding USEPA RSLs for tapwater for all metals and for most organic parameters.

The MDLs for groundwater parameters are less than the corresponding USEPA VISLs for protection of indoor air (residential) except for two parameters: vinyl chloride and mercury. On this basis, the screening process can be completed by direct comparison of the groundwater data to the screening levels, with a high degree of certainty.

In cases where a chemical is not detected and the screening level is below the MDL, the potential presence of the chemical will be assessed using lines of evidence based on available data for other media (soil/fill and soil gas) and other information such as Site history. Potential uncertainties will be further assessed for chemicals that are identified as potentially present. As required, supplemental risk calculations will be conducted to conservatively estimate the effects of individual chemicals with respect to the calculated risk levels.

Soil Gas (Worksheet 15-3)

The MDLs for soil gas parameters are less than the corresponding USEPA VISLs for all but one parameter (1,2-Dibromoethane - residential exposure). On this basis, the screening process can be completed by direct comparison of the soil gas data to the VISLs, with a high degree of certainty.

Surface water (Worksheet 15-4)

The MDLs for surface water parameters are less than the conservative USEPA Region 4 Chronic Freshwater Ecological Screening Levels in most cases. Exceptions exist for nine organic parameters (SVOCs and pesticides/PCBs) and one metal (cadmium). In some cases, the screening values are significantly less than the MDLs based on use of widely-used analytical methods. In the remaining cases (anthracene and cadmium), the screening values are within the same order of magnitude as the MDL.

The surface water MDLs are less than the Ohio River Basin Aquatic Life Outside Mixing Zone Average (OZMA) for all parameters except anthracene. The anthracene OZMA criterion is within the same order of magnitude as the MDL. On this basis the ecological screening can be completed without limitation for most parameters. Potential uncertainties will be further assessed for chemicals that are identified as potentially present.

The worksheet also includes screening values based on potential human health effects. In many cases, the USEPA national recommended human health ambient water quality criteria, Ohio River Basin Human Health values, and USEPA Tapwater RSLs are significantly less than the MDLs based on use of widely used analytical methods. USEPA national recommended human health ambient water quality criteria represent chemical levels in a water body that are not expected to cause adverse effects to human health. For purposes of assessing the surface water data relative to water quality criteria, human health values, and tapwater RSLs, all detected and non-detect values will be evaluated to determine their potential significance. This will include an overall comparison with all available surface water data to determine the data distribution and correlations.

In cases where a chemical is not detected and the screening level is below the MDL, the potential presence of the chemical will be assessed using lines of evidence based on available data for other media (soil/fill, groundwater, and soil gas) and other information such as Site history. Potential uncertainties will be further assessed for chemicals that are identified as potentially present. As required, supplemental risk calculations will be conducted to conservatively estimate the effects of individual chemicals with respect to the calculated risk levels.

Sediment (Worksheet 15-5)

The MDLs for sediment parameters are less than the ecological screening values for in all cases except for six pesticides. The MDLs for sediment parameters are less than the corresponding USEPA Residential and Industrial Soil RSLs, and consensus-based PEC values for all parameters. On this basis, the screening process can be completed by direct comparison of the sediment data to the screening values, with a high degree of certainty. In cases where chemicals are not detected and ecological screening values are less than the MDL, the potential presence of the chemical will be assessed using lines of

evidence based on available data for other media and other information such as Site history. Potential uncertainties will be further assessed for chemicals that are identified as potentially present. As required, supplemental risk calculations will be conducted to conservatively estimate the effects of individual chemicals with respect to the calculated risk levels.